

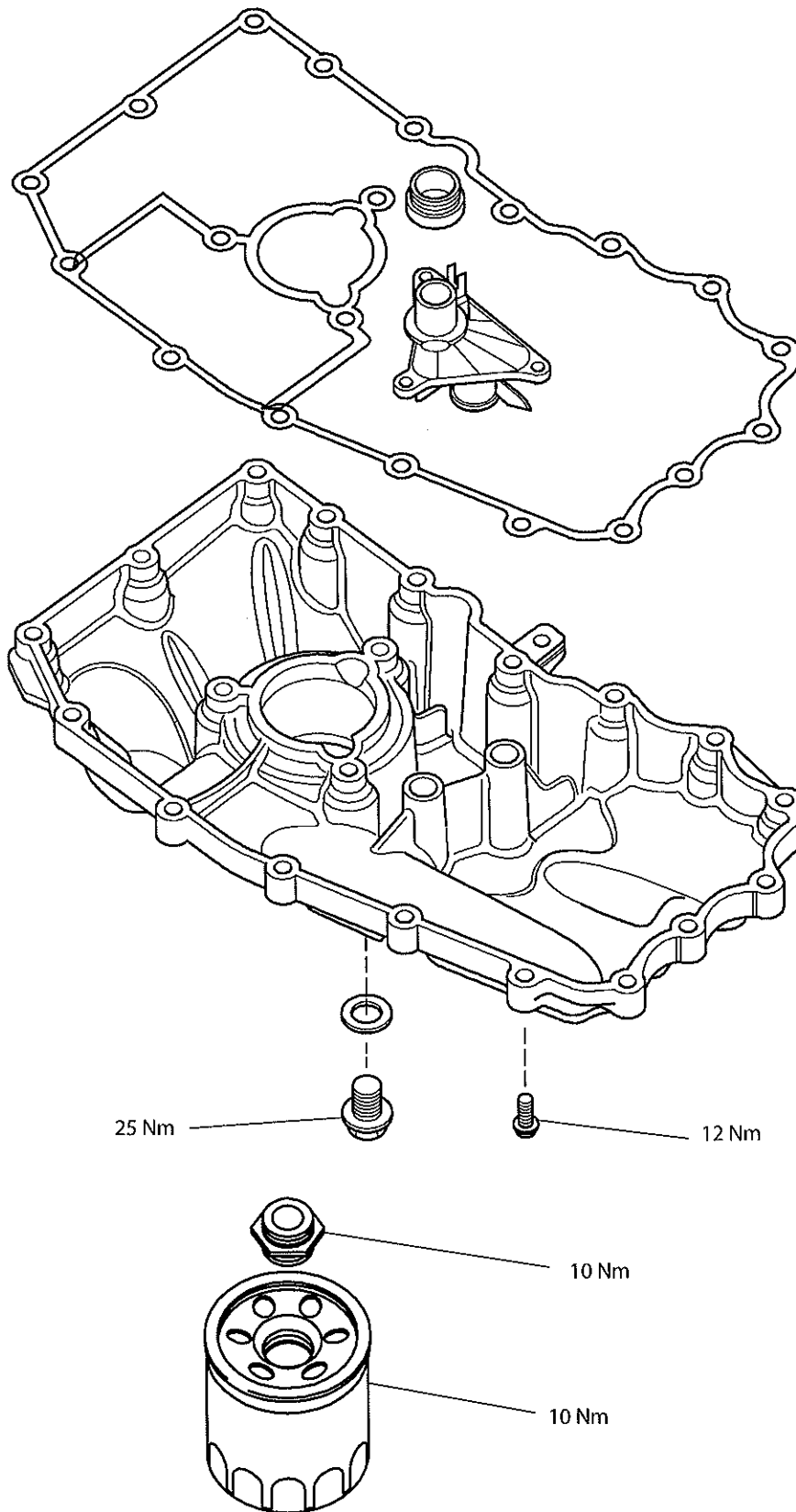
8 Lubrication

Table of Contents

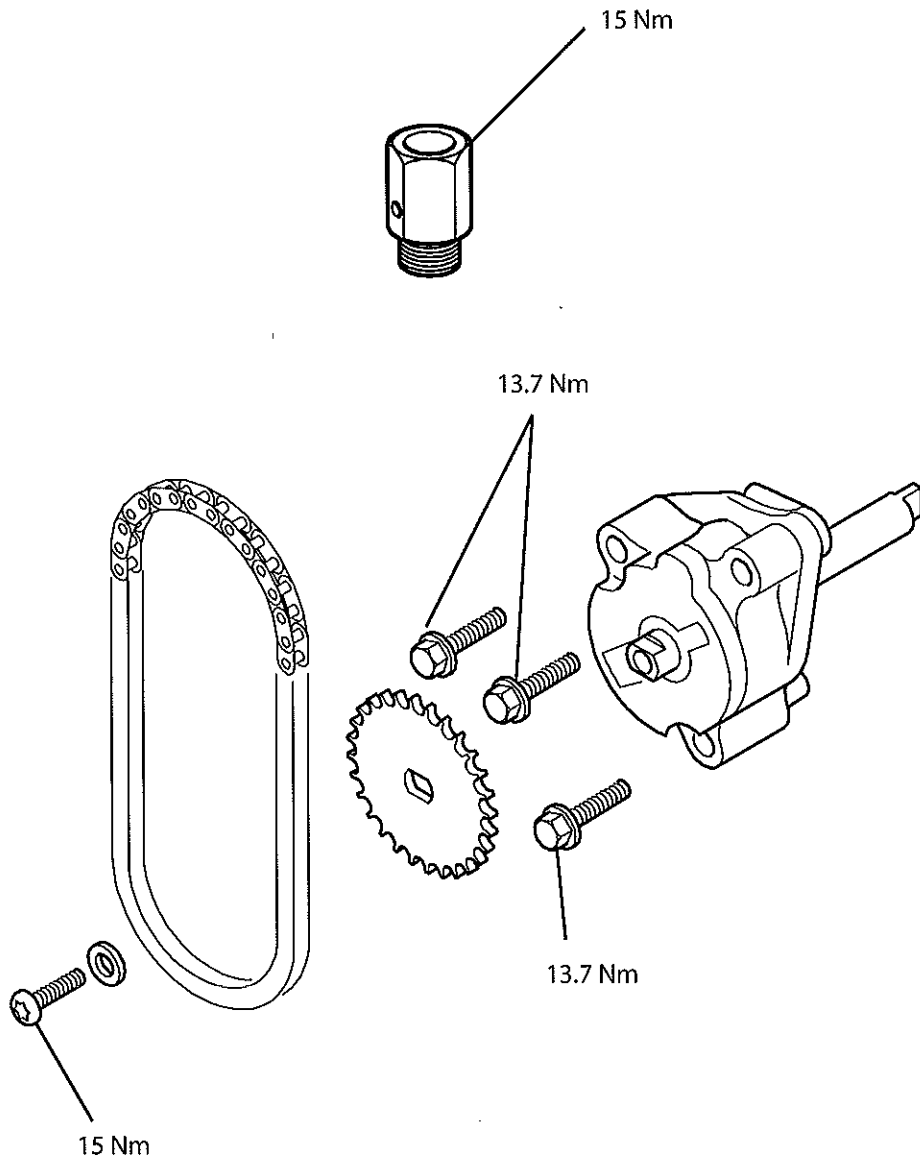
Exploded View - Sump	8.2
Exploded View - Oil Pump and Gears	8.3
Exploded View - Oil Cooler	8.4
Engine Oil Circuit	8.5
Engine Oil Circuit Description	8.6
Engine Oil	8.6
Specification	8.6
Triumph Engine Oil	8.6
Oil Level Inspection	8.7
Oil and Oil Filter Change	8.7
Disposal of Used Engine Oil	8.8
Oil Pump	8.8
Removal	8.9
Inspection	8.9
Installation	8.10
Low Oil Pressure Warning Light Switch	8.11
Installation	8.11
Sump	8.11
Removal	8.11
Inspection	8.12
Installation	8.12
Oil Cooler	8.13
Removal	8.13
Inspection	8.14
Installation	8.14

Lubrication

Exploded View - Sump

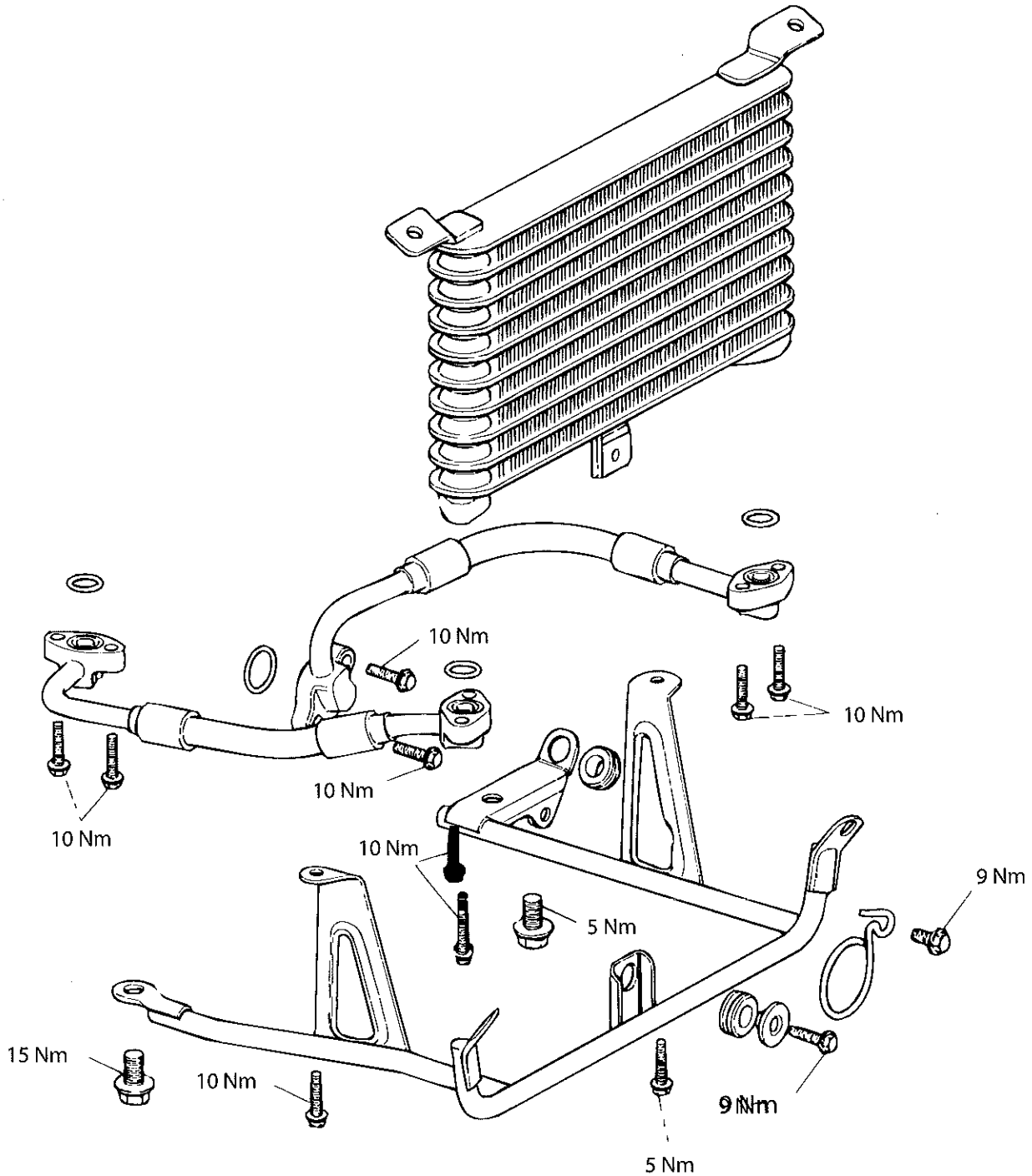


Exploded View - Oil Pump and Gears

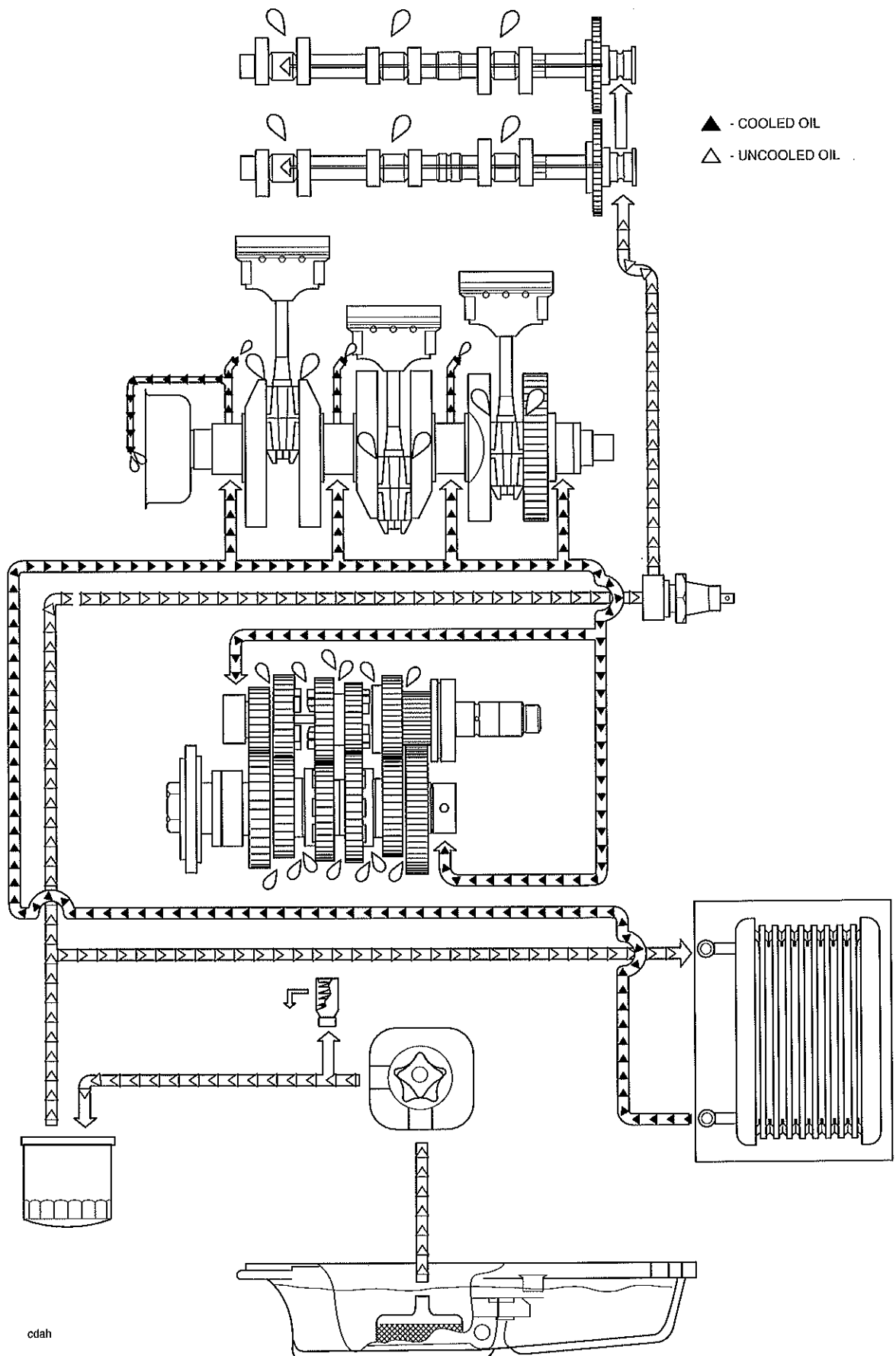


Lubrication

Exploded View - Oil Cooler



Engine Oil Circuit



Lubrication

Engine Oil Circuit Description

Oil is collected from the sump and is drawn through a mesh strainer into the oil pump rotor. The oil pump is fitted with a single pumping rotor which supplies pressurised oil to the lubrication circuit and the oil cooler.

Pressurised oil is delivered to the outside rim of the oil filter near to where the oil pressure relief valve is fitted. The relief valve is set to open at 75 lb/in² and when open, returns high pressure oil direct to the sump.

Filtered oil is then fed into the lower crankcase gallery. From here is distributed around the engine:

1. Some oil is sent directly to the cylinder head via a drilling in the upper crankcase and an external link pipe. A low oil pressure warning light switch is located at the crankcase end of the link pipe. Oil that arrives at the cylinder head is fed to both cams via a gallery in the cylinder head casting that delivers oil directly to the sprocket end cam bearings. Oil is then fed through the hollow camshafts to the other camshaft bearings, the tappet buckets and the valves.
2. The remaining oil is sent directly to the remote oil cooler (mounted beneath the radiator). Cooled oil is returned to the main gallery located under the crankshaft. Here it is delivered to the crankshaft main bearings and, via drillings in the crankshaft, to the big end bearings.

Spray jets located in the upper crankcase, behind the main bearing shells, lubricate the pistons and connecting rod small ends. These jets are fed oil from the crankshaft oil feed.

Oil is fed to the gearbox via internal oil pipes and drilling that supply oil directly to the end of each shaft. Oil is circulated along the gearbox shafts to exit holes that feed directly to the bearings, gears and selectors.

On the Sprint, oil is also fed to the alternator cover to aid cooling of the alternator. The oil is taken from the crankshaft oil feed and directed to the cover via drillings in the upper crankcase and through a small hole in the cover gasket.

Engine Oil

Specification

Use semi or fully synthetic 10W/40 or 15W/50 motorcycle engine oil which meets specification API SH (or higher) and JASO MA, such as Mobil 1 Racing 4T.

Caution

Triumph high performance fuel injected engines are designed to use semi or fully synthetic motorcycle engine oil which meets specification API SH (or higher) AND JASO MA.

Do not add any chemical additives to the engine oil. The engine oil also lubricates the clutch and any additives could cause the clutch to slip.

Do not use mineral, vegetable, non-detergent oil, castor based oils or any oil not conforming to the required specification. The use of these oils may cause instant, severe engine damage.

Ensure no foreign matter enters the crankcase during an oil change or top-up.

Triumph Engine Oil

Your Triumph Motorcycle is a quality engineered product which has been carefully built and tested to exacting standards. Triumph Motorcycles are keen to ensure that you enjoy optimum performance from your machine and with this objective in mind have tested many of the engine lubricants currently available to the limits of their performance.

Mobil 1 Racing 4T consistently performed well during our tests and has become our primary recommendation for the lubrication of all current Triumph motorcycle engines.

Mobil 1 Racing 4T, specially filled for Triumph, is available from your authorised Triumph dealer.

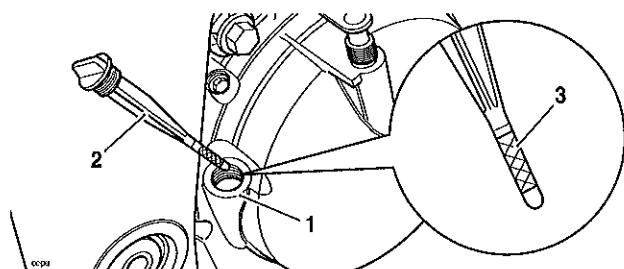
Oil Level Inspection

In order for the engine, transmission, and clutch to function correctly, maintain the engine oil at the correct level, and change the oil and oil filter in accordance with scheduled maintenance requirements.

! Warning

Motorcycle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated engine wear and may result in engine or transmission seizure. Seizure of the engine or transmission may lead to loss of motorcycle control and an accident.

1. Stop engine, then wait for at least 10 minutes to allow the oil to settle.
2. Remove the filler plug/dipstick, wipe the dipstick clean and screw the plug/dipstick fully home in the clutch cover.



1. Filler
2. Filler Plug/Dipstick
3. Hash-marked area

Note:

- The actual level is indicated when the motorcycle is level and upright, not on the side stand, and when the filler has been screwed fully home.
3. Remove the filler plug/dipstick.
 4. The oil level is indicated by hash marks on the filler plug/dipstick. When full, the indicated oil level must be level with the top of the hashed area.
 5. If the oil level is too low, add oil a little at a time through the dipstick hole in the clutch cover.

6. After each small amount of oil has been added, check the oil level by fully inserting and removing the dipstick. Continue to adjust as necessary until the oil level is correct.

Oil and Oil Filter Change

! Warning

Prolonged or repeated contact with engine oil can lead to skin dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contamination which can cause cancer. Wear suitable clothing and avoid skin contact. The engine oil and filter must be replaced in accordance with scheduled maintenance requirements.

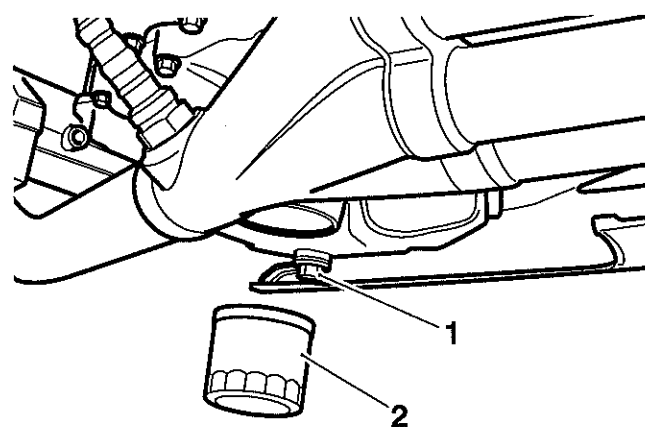
1. Warm up the engine thoroughly, and then stop the engine.

Place an oil pan beneath the engine.

! Warning

The oil may be hot to the touch. Contact with hot oil may cause the skin to be scalded or burned.

2. Remove the oil drain plug.

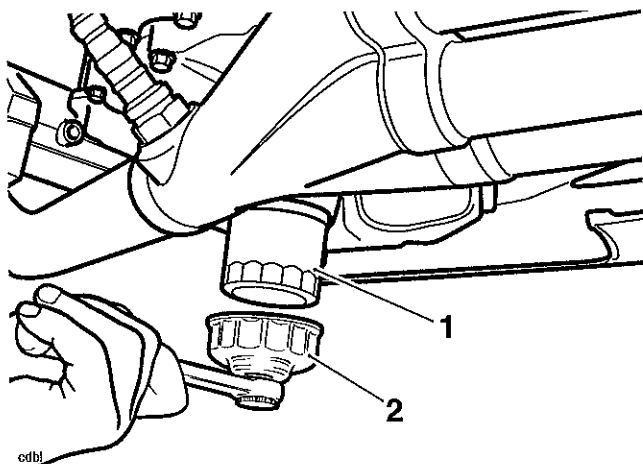


odbk

1. Oil Drain Plug
2. Oil Filter
3. With the motorcycle on level ground, and on the sidestand, allow the oil to completely drain.

Lubrication

- Unscrew and remove the oil filter using Triumph service tool T3880312.



1. Oil Filter

2. Tool T3880312

- Discard the oil filter.
- Pre-fill a new oil filter with clean engine oil.
- Apply a smear of clean engine oil to the sealing ring of the new oil filter.
- Fit the oil filter and tighten to **10 Nm**.
- After the oil has completely drained out, fit a new sealing washer to the drain plug. Fit and tighten the plug to **25 Nm**.
- Fill the engine with new oil of the type and grade listed previously and in the specification section.
- Start the engine and allow to idle.

! Caution

Racing the engine before the oil reaches every part can cause engine damage or seizure.

- Ensure that the oil pressure warning light extinguishes shortly after starting.

! Caution

If the engine oil pressure is too low, the low oil pressure warning light will illuminate. If this light stays on when the engine is running, stop the engine immediately and investigate the cause. Running the engine with low oil pressure will cause engine damage.

- Stop the engine and check the oil level. Adjust if necessary.

Disposal of Used Engine Oil

To protect the environment, do not pour oil on the ground, down sewers or drains, or into water courses. Dispose of used oil sensibly. If in doubt contact your local authority.

Oil Pump

! Warning

Prolonged or repeated contact with engine oil can lead to skin dryness, irritation and dermatitis. Furthermore, used engine oil contains potentially harmful contaminants which can cause cancer.

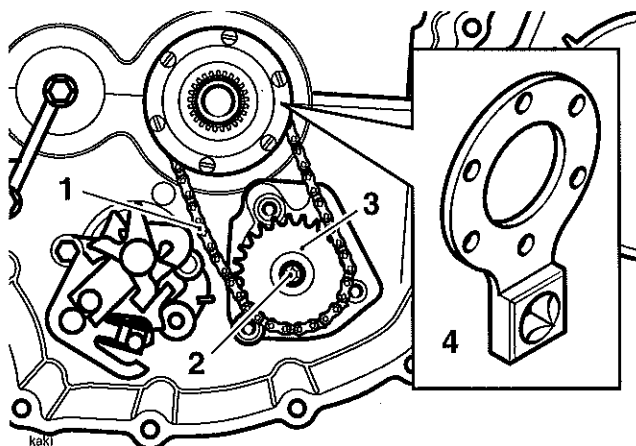
When handling used engine oil, always wear protective clothing and avoid any skin contact with the oil.

! Caution

Do not pour engine oil on the ground, down sewers or drains, or into water courses. To prevent pollution of water courses etc., dispose of used oil sensibly. If in doubt contact your local authority.

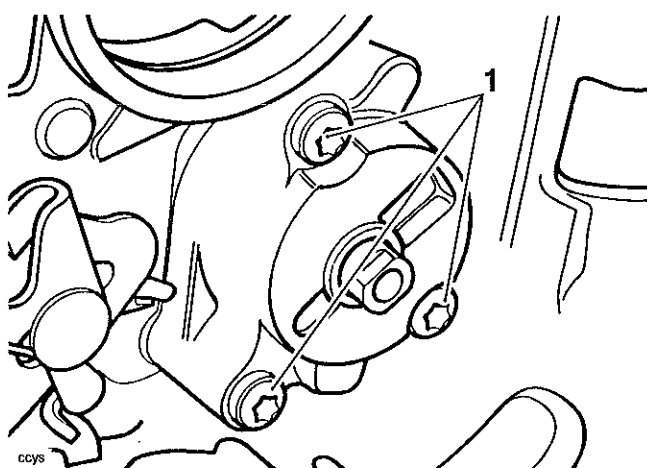
Removal

1. Remove the seat (see page 16-8).
2. Disconnecting the battery, negative (black) lead first.
3. Remove the clutch (see page 4-5).
4. Fit tool T3880371 to the drive dogs on the upper oil pump drive sprocket. Hold the tool to prevent rotation and release the bolt securing the oil pump drive sprocket to the oil pump.



1. Oil pump drive chain
2. Pump drive sprocket fixing
3. Pump drive sprocket
4. Tool T3880371

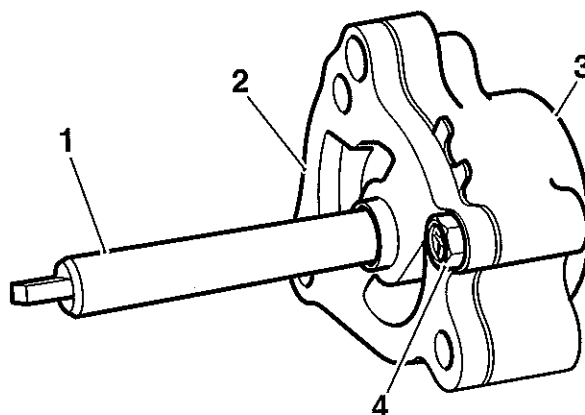
5. Remove the tool, upper and lower sprockets, upper sprocket bearing and the drive chain by sliding all components off the shaft together.
6. Release the bolts securing the oil pump to the crankcase and withdraw the oil pump.



1. Pump bolts

Inspection

1. Release the screw and withdraw the oil pump plate from the pump body.



1. Oil pump drive shaft
2. Oil pump plate
3. Oil pump body
4. Screw

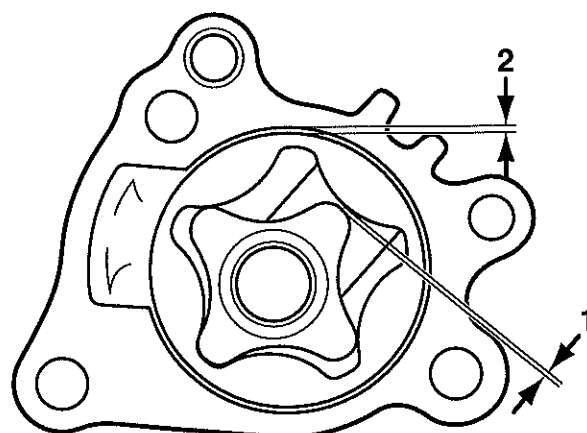
⚠ Caution

If any part of the oil pump is found to be outside the service limit, the complete pump must be replaced. Severe engine damage may result from the continued use of a faulty oil pump.

2. Measure the rotor tip clearance using feeler gauges.

Rotor Tip Clearance

Standard:	0.15 mm
Service limit:	0.20 mm



1. Rotor tip clearance
2. Pump body clearance

Lubrication

3. Measure the pump body clearance using feeler gauges.

Body Clearance

Standard:	0.15 - 0.22 mm
Service limit:	0.35 mm

4. Measure the pump end clearance.

Pump End Clearance

Standard:	0.02 - 0.07 mm
Service limit:	0.10 mm

5. (a) If all clearances are within service limits, liberally apply clean engine oil to all internal components and refit the oil pump plate to the oil pump body.
(b) If any clearance measured is outside the service limits, renew the complete pump.
6. Inspect all the sprocket and chain for wear and/or damage. Replace the sprocket and chain if wear and/or damage is found.

Installation

⚠ Caution

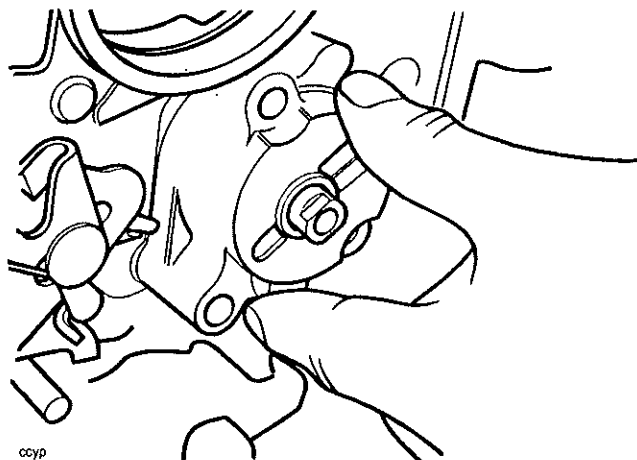
Before fitting the oil pump to the crankcase ensure the pump internal surfaces have been 'wetted' with clean engine oil. The pump may fail to pick-up oil from the sump if the surfaces have not been 'wetted'. This will cause the engine to run without engine oil pressure and will lead to severe engine damage.

1. Fill the oil pump with new engine oil, turning the pump rotor as the oil is poured in to ensure all surfaces are coated with oil.
2. Position the oil pump to the crankcase and insert into the opening provided.

Note:

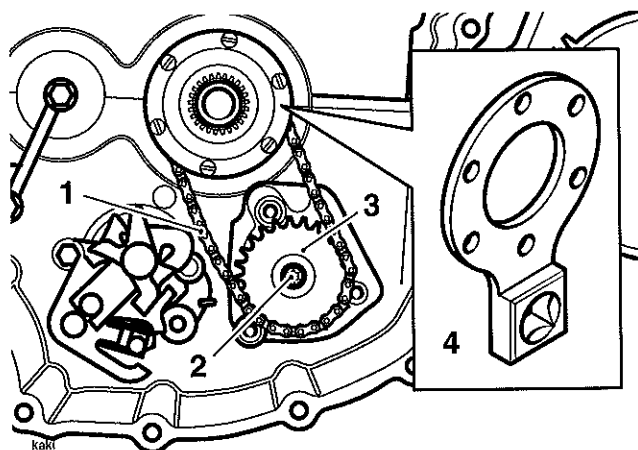
- Use the sprocket end of the oil pump shaft to turn the drive peg into alignment with the drive on the water pump.

3. Fit the oil pump to the crankcase, ensure the water pump drive peg locates into the drive on the water pump shaft. Tighten the bolts to **13.7 Nm**.



Pump Insertion

4. As an assembly, slide the upper drive sprocket bearing, upper drive sprocket, drive chain and pump sprocket onto the input shaft and oil pump.

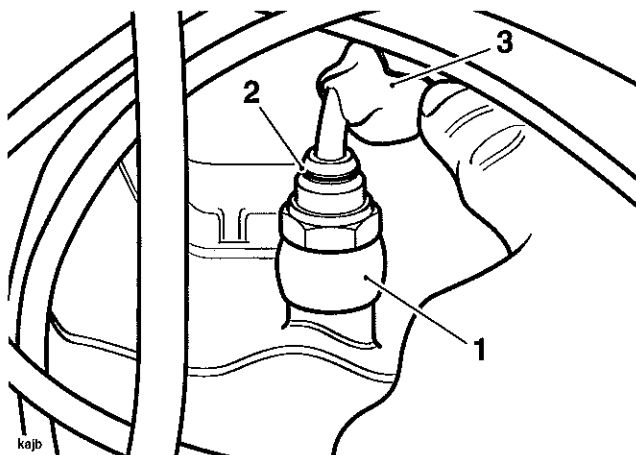


1. Oil pump drive chain
2. Pump drive sprocket fixing
3. Pump drive sprocket
4. Tool T3880371

5. Locate the pump drive sprocket onto the pump ensuring that the drive engages correctly.
6. Refit tool T3880371 to the upper drive sprocket and tighten a new oil pump drive sprocket centre bolt to **15 Nm**. Remove the tool.
7. Assemble the clutch (see page 4-9).
8. Reconnect the battery, positive (red lead) first.
9. Refill the engine with oil (see page 8-7).

Low Oil Pressure Warning Light Switch

The low oil pressure warning light switch is located at the lower end of the camshaft oil feed pipe.



1. Oil Feed Pipe
2. Low Oil Pressure Warning Light Switch
3. Electrical Connection/Covering Boot

1. Remove the seat (see page 16-8).
2. Disconnect the battery negative (black) lead first.
3. Remove the right hand lower fairing (see page 16-11).
4. Lift the covering boot and disconnect the electrical connection to the switch.
5. Remove the switch and collect the copper washers.

Installation

1. Using new copper washers on both sides of the oil pipe union, fit the switch and tighten to 13 Nm.
2. Refit the electrical connection.
3. Refit the covering boot.
4. Refit the right hand lower fairing (see page 16-12).
5. Reconnect the battery, positive (red) lead first.

Sump

Removal

1. Remove the seat (see page 16-8).
2. Disconnect the battery negative (black) lead first.
3. Drain the engine oil (see page 8-7).

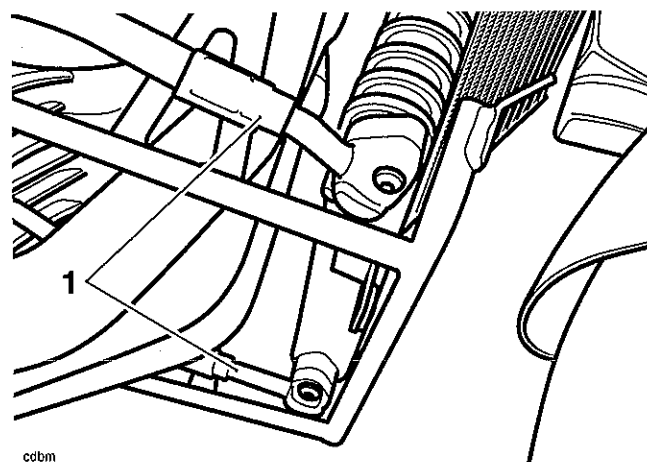
Warning

The oil may be hot to the touch. Contact with hot oil may cause the skin to be scalded or burned.

Warning

Prolonged or repeated contact with engine oil can lead to skin dryness, irritation and dermatitis. In addition used engine oil contains potentially harmful contaminants which can cause cancer. Wear suitable clothing and avoid skin contact.

4. Remove the lower fairings (see page 16-11).
5. Note the position of the oil cooler pipes prior to disconnecting the pipes from the sump.



1. Oil Cooler Pipes

6. Remove the exhaust system (see page 10-105).

Warning

The exhaust system will be hot if the engine has recently been running. Always allow sufficient time for the exhaust to cool before working on or near the exhaust system.

Contact with a hot exhaust could result in burn injuries.

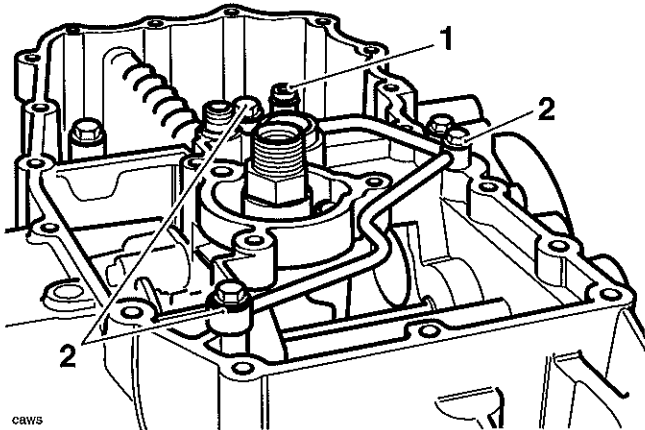
7. Remove the oil filter (see page 8-7).

Lubrication

8. Release the bolts securing the sump to the lower crankcase.
9. Detach the sump and collect the oil transfer tube.

Note:

- The oil transfer tube may remain in the crankcase or become detached with the sump.



1. Oil transfer tube
2. Transmission oil feed pipe fixings

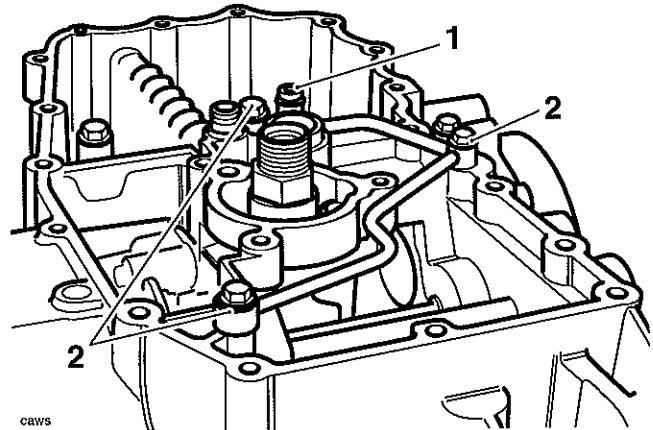
10. Remove the sump gasket.
11. If necessary, remove the oil transfer pipe and collect the sealing washer from either side of each joint.

Inspection

1. Inspect the oil transfer tube 'O' rings for damage and swelling. Renew as necessary.
2. Inspect the gearbox oil feed pipe 'O' ring for damage and swelling. Renew as necessary.
3. Inspect the oil pick-up for correct fitment in the lower crankcase.

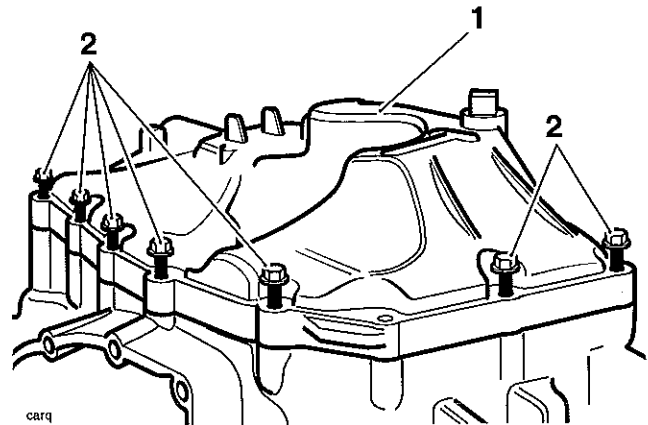
Installation

1. Fit the oil transfer tube to the crankcase.



1. Oil transfer tube
2. Transmission oil feed pipe fixings

2. If removed, fit the oil transfer pipe incorporating new washers. Tighten the fixings to **8 Nm**.
3. Incorporating a new sump gasket, position the sump to the lower crankcase.
4. Tighten the sump fixings to **12 Nm**.



1. Sump
2. Fixings

5. Incorporating new 'O' rings, reconnect the oil cooler pipes. Tighten the cooler pipe bolts to **10 Nm**.
6. Pre-fill a new oil filter with clean engine oil.
7. Apply a smear of clean engine oil to the seal of the new oil filter.
8. Fit the oil filter and tighten to **12 Nm** using tool T3880012.
9. Refit the exhaust system (see page 10-106).

Note:

- Use new exhaust gaskets at the downpipe connections with the cylinder head.
10. Fill the engine with the correct grade of engine oil
 11. Reconnect the battery positive (red) lead first.
 12. Start the engine and ensure that the low oil pressure warning light goes out shortly after starting.
 13. Stop the engine and adjust the engine oil level.
 14. Refit the lower fairings (see page 16-12).
 15. Refit the seat (see page 16-8).

Oil Cooler

Removal

1. Remove the seat (see page 16-8).
2. Disconnect the battery negative (black) lead first.
3. Remove both lower fairings (see page 16-11).
4. Drain the engine oil (see page 8-7).

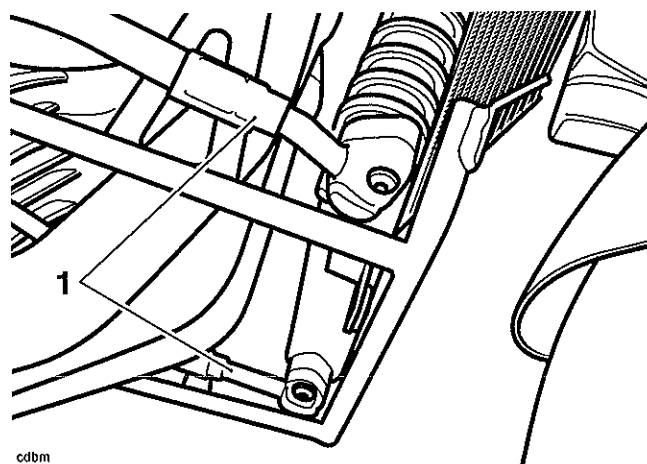
Warning

The oil may be hot to the touch. Contact with hot engine oil may cause skin to be scalded or burnt.

Warning

Prolonged or repeated contact with engine oil can lead to skin dryness, irritation and dermatitis. In addition used engine oil contains potentially harmful contaminants which can cause cancer. Wear suitable clothing and avoid skin contact.

5. Disconnect the oil cooler feed and return hoses.

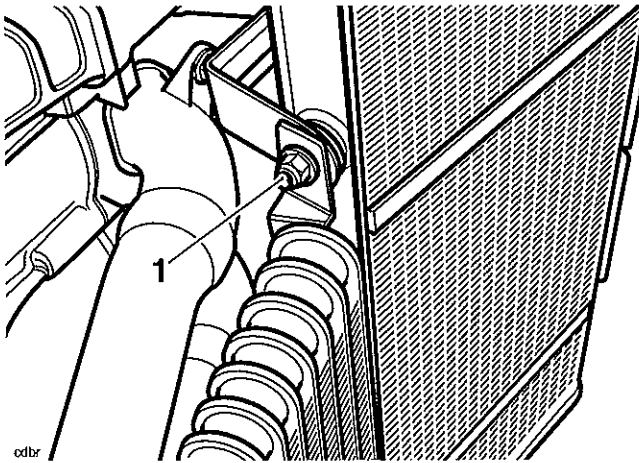


cdm

1. Oil cooler hoses

Lubrication

6. Release the oil cooler fixings.



1. Upper oil cooler fixing

7. Detach the oil cooler.

Inspection

1. Inspect the oil cooler connection points for fractures and signs of oil leakage.
2. Check the oil cooler fins for damage and leaks.

Installation

1. Position the oil cooler to the retaining brackets.
2. Refit and tighten the oil cooler fixings to **9 Nm**.
3. Align the oil cooler pipes to the cooler and, incorporating new O-rings, tighten the fixings to **10 Nm**.
4. Refill the engine with oil (see page 8-7).
5. Reconnect the battery positive (red) lead first.
6. Start the engine and check for oil leaks. Once a leak check has been made, stop the engine and allow to stand for 10 minutes.
7. Adjust the engine oil level (see page 8-7).
8. Refit both lower fairings (see page 16-12).
9. Refit the seat (see page 16-8).